

No.: SHIN2007043011CM

Date: Aug 06, 2020

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CUSTOMER NAME: CROWN HPL LIMITED

ADDRESS: A12, A13, 3/F., SHATIN INDUSTRIAL CENTRE, 5-7 YUEN SHUN

CIRCUIT, SHATIN, NT, KOWLOON, HONG KONG

Sample Name : DECORATIVE REFRACTORY PLATE

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

Test Required : Please see the next page(s)

SGS Ref. No. : SDFS2007004160RS

Ref. Standard : Please see the next page(s)

Date of Receipt : Jul 16, 2020
Testing Start Date : Jul 16, 2020
Testing End Date : Aug 06, 2020

Test result(s) : For further details, please refer to the following page(s)

(Unless otherwise stated the results shown in this test report refer only to

the sample(s) tested)

Signed for SGS-CSTC Standards Technical Service (Shanghai)Co., Ltd.

Erin Huang

Authorized signatory





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Summary of Results:

No.	Test Item	Test Method	Result	Conclusion	
1	Thickness	EN 438-3:2016 Clause 6 &	1.02 mm	Pass	
'	THICKHESS	EN 438-2:2016 Clause 5	1.02 111111	F d 3 3	
2	Resistance to Surface	EN 438-3:2016 Clause 6 &	250 r	Pass	
	Wear	EN 438-2:2016 Clause 10	2501	F d 3 3	
3	Resistance to Immersion	EN 438-3:2016 Clause 6 &	See Result	Pass	
3	in Boiling Water	EN 438-2:2016 Clause 12	See Nesun	F 033	
4	Resistance to Water	EN 438-3:2016 Clause 6 &	Rating 5	Pass	
4	Vapour	EN 438-2:2016 Clause 14	Rating 5	F 433	
5	Posistanas ta Dry Host	EN 438-3:2016 Clause 6 &	Rating 5	Pass	
5	Resistance to Dry Heat	EN 438-2:2016 Clause 16	Rating 5	1 433	
6	Dimension Stability at	EN 438-3:2016 Clause 6 &	See Result	Pass	
6	Elevated Temperature	EN 438-2:2016 Clause 17	See Result	Fd55	
7	Resistance to Impact by	EN 438-3:2016 Clause 6 &	See Result	Pass	
'	Large Diameter Ball	EN 438-2:2016 Clause 21	See Result	Fd55	
8	Resistance to Cracking	EN 438-3:2016 Clause 6 &	Rating 5	Pass	
0	under Stress	EN 438-2:2016 Clause 23	Rating 5	F d 3 3	
9	Resistance to Scratching	EN 438-3:2016 Clause 6 &	Rating 5	Page	
9	Resistance to Scratching	EN 438-2:2016 Clause 25	Rating 5	Pass	
11	Resistance to Impact by	EN 438-3:2016 Clause 6 &	43 N	Pass	
''	Small-Diameter Ball	EN 438-2:2016 Clause 20	43 IV	Fa55	
12	Water Vapor Protection of	EN 438-2:2016+A1:2018	0.02mm	,	
12	Substrate	Clause 13	0.0211111	/	
L	1		1	l	

Note: Pass : Meet the requirements;

Fail: Does not meet the requirements;

/: Not Apply to the judgment.



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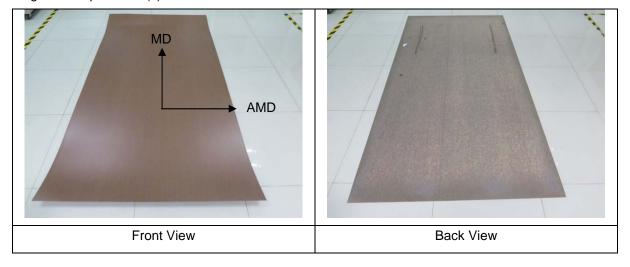


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Original Sample Photo(s):







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1. Test Item: Thickness

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 5

Test Condition:

Specimen: Product, 1pc

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438- 3:2016 Table 4	Conclusion	
Thickness (mm)	1.02	1±0.10	Pass	

Original Data:

Test Item	Test Result				
Tool itom		Average Value			
Thickness (mm)	1.01 1.02 1.01 1.03 1.02				





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2. Test Item: Resistance to Surface Wear

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 10

Test Condition:

Specimen: 100mm×100mm×1mm, 3pcs

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Resistance to Surface Wear - IP Value (r)	250	≥150	Pass

Original Data:

Test Item	Test Result			
restitem	Individual Value			Average Value
Resistance to Surface Wear - IP Value (r)	250	250	300	250

Note: Test specimens were cut from original sample.





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3. Test Item: Resistance to Immersion in Boiling Water

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 12

Test Condition:

Specimen: 50mm×50mm×1mm, 4pcs

Test condition: Immersion in boiling water for 2h→ Immersion in cooling water (23°C) for 15min.

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

	Test Item	Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Desistance to	Water absorption (%)	5.8	/	/
Resistance to Immersion in	Swelling in thickness (%)	4.5	1	/
Boiling Water	Surface rating scale	Rating 5	≥ Rating 3	Pass
	Edge rating scale	Rating 5	≥ Rating 3	Pass

Original Data:

	Test Item		Test Result			
	Ir	Individual value				
	Water Absorption (%)	5.5	6.3	5.7	5.8	
		4.9	3.9	5.0		
Resistance to	Swelling in Thickness (%)	5.0	5.0	4.0	4.5	
Immersion in		4.9	2.9	3.9		
Boiling Water		5.0	4.7	4.9		
	Surface Rating Scale	Rating 5	Rating 5	Rating 5	/	
	Edge Rating Scale	Rating 5	Rating 5	Rating 5	/	



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Note:

1) Test specimens were cut from original sample.

2) Surface rating scale:

Rating 5: No visible change

Rating 4: Slight change of gloss and/or colour, only visible at certain viewing angles

Rating 3: Moderate change of gloss and/or colour

Rating 2: Marked change of gloss and/or colour or surface blistering

Rating 1: Surface layers delamination

3) Edge rating scale:

Rating 5: No visible change

Rating 4: Slight hairline edge cracks visible to the naked eyes

Rating 3: Moderate edge cracks

Rating 2: Severe edge cracks

Rating 1: Core layers delamination





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4. Test Item: Resistance to Water Vapour

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 14

Test Condition:

Specimen: 100mm×100mm×1mm, 1pc

Test time: 1h

Test water: Boiling water

Lab environmental condition: 23±2°C, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Resistance to Water Vapour	Rating 5	≥ Rating 3	Pass

Note:

1. Test specimens were cut from original sample.

2. Expression of results:

Rating 5: No visible change

Rating 4: Slight change of gloss and/or colour, only visible at certain viewing angles

Rating 3: Moderate change of gloss and/or colour

Rating 2: Marked change of gloss and/or colour

Rating 1: Blistering and/or delamination





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5. Test Item: Resistance to Dry Heat

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 16

Test Condition:

Specimen: 230mm×230mm×1mm, 1pc

Test temperature: 160°C

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test item	Test result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Resistance to Dry Heat	Rating 5	≥Rating 3	Pass

Note: Test specimens were cut from original sample.

Rating scale:

Rating scale	Description
5	No change.Test area indistinguishable from adjacent surrounding area
	Minor change
4	Test area distinguishable from adjacent surrounding area, only when the light
4	source is mirrored on the test surface and is reflected towards the observer's eye,
	e.g. discoloration, change in gloss and colour
	Moderate change
3	Test area distinguishable from adjacent surrounding area, visible in several viewing
3	directions, e.g. discoloration, change in gloss and colour, no change in the surface
	structure, e.g. deformation, cracking, blistering
	Significant change
2	Test area clearly distinguishable from adjacent surrounding area, visible in all
2	viewing directions, e.g. discoloration, change in gloss and colour, and/or structure of
	the surface slightly changed, e.g. slight cracking, slight blistering
	Strong change
1	The structure of the surface being distinctly changed e.g. strong cracking, strong
	blistering and/or discoloration, change in gloss and colour, and/or the surface
	material being totally or partially delaminated



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6. Test Item: Dimension Stability at Elevated Temperature

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 17

Test Condition:

Specimen: 200mm×50mm×1mm, 8pcs (4pcs for each direction)

Dry heat test: 70°C, 24h

High humidity test: 40°C, 90%RH, 96h

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item		Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Dimension Stability	Machine direction	0.47	≤0.55	Pass
at Elevated Temperature (%)	Across-machine direction	0.62	≤1.05	Pass

Original Data:

Test item		Test result			
		Dry heat test	High humidity test	Mean	
Dimensional	Machine direction	-0.44	0.03	0.47	
stability at elevated temperature (%)	Across-machine direction	-0.40	0.22	0.62	

Note: Test specimens were cut from original sample.





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7. Test Item: Resistance to Impact by Large Diameter Ball

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 21

Test Condition:

Specimen: 230mm×230mm×1mm, 5pcs

Diameter of Steel ball: 42.8mm

Weight of Steel ball: 324g Height of Impact: 800mm

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Resistance to Impact by Large Diameter Ball -	Max.: 8.82	≤10	Pass
Indent Diameter (mm)			

Original Data:

Test Item	Test Result				
TOST ITOM	1#	2#	3#	4#	5#
Indent Diameter (mm)	7.38 8.31 8.82 8.77 8.05			8.05	
Appearance	No crack on the surface				

Note: Test specimens were cut from original sample.





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8. Test Item: Resistance to Cracking under Stress

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 23

Test Condition:

Specimen: 150mm×50mm×1mm, 4pcs

Test temperature: 50°C, 6h

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Resistance to Cracking under Stress	Rating 5	≥ Rating 4	Pass

Note: Test specimens were cut from original sample.

Rating scale:

Rating 5: No evidence of cracking

Rating 4: Hairline cracks only visible under ×6 magnification

Rating 3: Cracks visible with normal vision (corrected if necessary) from the edge of the hole, but not extending to either edge of the specimen

Rating 2: A crack visible with normal vision (corrected if necessary) from the edge of the hole, extending to one edge of the specimen such that the specimen is not broken into two pieces

Rating 1: Specimen broken into two pieces





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9. Test Item: Resistance to Scratching

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 25

Test Condition:

Specimen: 100mm×100mm×1mm, 1pc

Rubbing stylus: Hemispherical diamond scratching point of radius (0.09±0.003)mm and an included

angle of (90±1)°

Rotational frequency: (5±1)min-1

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
Resistance to Scratching	Rating 5	≥ Rating 2	Pass

Note:

- 1) Test specimens were cut from original sample.
- 2) According to EN 438-2:2016 table 6 rating scale as follow:

Rating	Discontinuous scratches, or faint superficial marks, or no visible marks	≥90% continuous double circle of scratch marks clearly visible
Rating 5	6N	>6N
Rating 4	4N	6N
Rating 3	2N	4N
Rating 2	1N	2N
Rating 1	-	1N





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10. Test Item: Resistance to Staining

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 26

Test Condition:

Specimen: 100mm×100mm×1mm, 5pcs

Lab Environmental Condition: 23±2°C, 50±5%RH

Test Result:

Test Item		Test Result	Requirement in EN 438- 3:2016 Table 5 HGS	Conclusion
	Acetone	Rating 5	≥ Rating 5	Pass
	120g/L Coffee	Rating 5	≥ Rating 5	Pass
Resistance	25% Sodium hydroxide	Rating 5	≥ Rating 4	Pass
to Staining	30% Hydrogen peroxide	Rating 5	≥ Rating 4	Pass
	Carbon black suspension in paraffin oil (Shoe polish simulant)	Rating 5	≥ Rating 4	Pass





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Note:

1) Test specimens were cut from original sample.

2) Rating code:

Numerical rating	Description
5	No change
3	Test area indistinguishable from adjacent surrounding area
	Minor change
4	Test area distinguishable from adjacent surrounding area, only when the light
4	source is mirrored on the test surface and is reflected towards the observer's
	eye, e.g. discoloration, change in gloss and colour
	Moderate change
3	Test area distinguishable from adjacent surrounding area, visible in several
	viewing directions, e.g. discoloration, change in gloss and colour
	Significant change
2	Test area clearly distinguishable from adjacent surrounding area, visible in all
2	viewing directions, e.g. discoloration, change in gloss and colour, and/or
	structure of the surface slightly changed, e.g. cracking, blistering
	Strong change
1	The structure of the surface being distinctly changed and/or discoloration,
ı	change in gloss and colour, and/or surface material being totally or partially
	delaminated





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11. Test Item: Resistance to Impact by Small-Diameter Ball

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 20

Test Result:

Test Item	Test procedures/requirements	Rating/ Result
	The test shall be carried out in the laboratory atmosphere.	
	Place the steel plate on a convenient rigid horizontal surface and	
	locate the specimen on it with its decorative surface uppermost. Fix	
	the impact tester in its support fixture, load the tester, place the	
	assembly on the specimen and release the impact bolt. Start	
	preliminary test with a spring force of 10 N and increase by 5 N on	
	each occasion to determine the minimum spring force at which the	
	surface of the specimen shows damage due to impact stress.	
	Test further specimens for the final determination of the maximum	
	force at which no damage occurs. For this purpose, start with the	
Resistance	spring force determined in the preliminary test and reduce it in	
to Impact	suitable stages, for example 1 N, after every five strikes.	Max
by Small-	To make any damage more easily visible, the surface of the	resistance to
Diameter	specimen shall be rubbed with a contrast medium after the test.	impact force:
Ball	The distance between points of impact shall be at least 20 mm and	43 N
Dall	between points of impact and the edge of the specimen at least 30	
	mm.	
	Examine the surface tested for damage at the points of impact. For	
	the purpose of this test, damage is defined by the presence of fine	
	hairline cracks (which are frequently concentric), continuous cracks	
	or flaking of the decorative surface. Indentations without cracks do	
	not count as damage.	
	If the test is conducted only to determine whether the impact	
	strength of a material exceeds a limiting value, the specimen shall	
	sustain no damage after five successive individual impact strikes	
	with the prescribed spring force.	



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12. Test Item: Water Vapor Protection of Substrate Test Method: EN 438-2:2016+A1:2018 Clause 13

Test Condition:

Specimen: 100mm×100mm×1.00mm, 2pcs

Treatment condition: Steam, 1h

Test result:

Test item	Test result
Water Vapor Protection of Substrate	0.02mm

Note: The test was performed by SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center.

****** End of report******

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